UX 3025: Data Visualization

Winter 2021-2022
Class Meetings: Mondays, Wednesdays, and Fridays 3:00-3:50 in VT 168

Instructor	**Contact**	**Office Location & Hours**
Dr. Katie Panciera	panciera@msoe.edu	DH 435 Tuesdays 3:00-3:30pm
Pronouns: She/her/hers	612-804-6543 (cell)	& by appointment

Course Description

Data visualization is the presentation of data in a pictorial or graphical format. It enables decision makers to see analytics presented visually, so they can grasp difficult concepts or identify new patterns. Data visualization combats information overload and makes data easier to comprehend and understand complex data sets, therein making it easier to remember and make decisions. Furthermore, visual representations help to engage more diverse audiences in the process of analytic thinking. This form of visual communication is a highly sought-after skill as companies look to hire candidates who can present their insights clearly. Students will learn the fundamentals and best practices of data visualization analysis and take a deep dive into how the mind perceives and interprets visual information with. Data visualization strategies and approaches will be taught through a mixture of lecture, discussion, and the use of data visualization tools. (prereq: UX 1511)

Student Learning Outcomes

- Know how the mind perceives and interprets visual information
- Recognize data visualization best practices and know how to model data in a visual manner
- Demonstrate knowledge in gathering, preparing, and analyzing complex data sets
- Apply knowledge of color, typography, and visual design practices to visualize data
- Explain and present the story surrounding data
- Show proficiency in basic functions of data visualization software to create infographics, interactive data visualizations, and data maps

Why Data Viz?

Data is a critical part of communication in a professional context and it is easy to create and present visualizations that misrepresent your data. This course is designed to help you both create valid, well designed visualizations that will assist you in getting your point across in everything from day to day discussions with colleagues to critical reviews with leadership.

Course Materials

Required Course supplies:

- Storytelling with Data by Cole Nussbaumer Knaflic (available through the MSOE digital library)
- All other reading/listening materials will be available from the course Canvas site
- Plain paper (lined, unlined, graph) for sketching
- Colored pencils (at least two colors)
- Pencil & eraser or Pen

Free online materials including:

- Podcasts, TED Talks, YouTube videos

Highly recommended (but not required)
- How Charts Lie by Alberto Cairo

📟 Course Assignments Outline

- **Weekly Reflections**: On a weekly basis, you will be asked to reflect on their activities, readings, and discussions to deepen their understanding and contemplate additional problems.
- **Quizzes:** Throughout the quarter you'll have 3 brief (20 minute) quizzes to test your understanding of concepts from class. The approximate dates are below.
- **Seek & Find:** As we go through the quarter, you'll be asked to find data visualizations to meet various criteria and then share them on an online forum along with the answers to several brief questions. This will help you work on deciphering the graphs of others
- **Projects:** You will have a number of projects in this course that range from smaller projects (like cleaning a data set) to bigger projects (like creating and presenting a data visualization). The details on the worth of each project will be clear on the Canvas page.

📅 Week by Week Outline (This is in flux)

Readings and Materials are TBD and may fluctuate based on the needs of the class.
* Indicates potential Portfolio piece

WEEK	TOPIC	DUE
1	**Introductions, Deception, & Data Literacy** **Workshop:** Data Literacy Read: Storytelling with Data Introduction & Chapter 1 Listen: 99% Invisible: Florence Nightingale: Data Viz Pioneer Optional: Read Chapter 1 of How Charts Lie	First Day Survey Reflection 1 Seek and Find: Any Data Viz
2	**Perception and Design** **Workshop:** Finding the Story, Sketching, and Exploring Data Read: Storytelling with Data Chapter 4	Reflection 2 Sketching Exercise Due Seek and Find: Viz that demonstrates principles
3	**Picking a Chart Type** **Workshop**: Working with Sheets/Excel and Tableau Read: Storytelling with Data Chapter 2	Quiz 1 Seek and Find: A New type of Viz to you
4	**Data Cleaning and Processing** **Workshop**: Data Processing and Creating Graphs	Reflection 3 Data Cleanup Exercise Due Seek and Find: Deceptive Visualization
5	**Labels and Cleanup**	Reflection 4

	Workshop: Making Graphs Read: Storytelling with Data Chapter 3 & Chapter 5	Seek and Find: Viz with great writing
6	**Critique and Return to the User** **Workshop:** Critique	Visualization Due* Quiz 2
7	**Storytelling** **Workshop:** Deciphering Graphs Read: Storytelling with Data Chapter 7	Reflection 5 Big Idea Worksheet due Seek and Find: Viz that does a good job telling a story
8	**Presenting Data** **Workshop:** Big Idea Revision and Presentation Prep Read: Storytelling with Data Chapter 8 Listen: [Policy Viz Episode with Meagan Longoria](#)	Reflection 6 Visualization for Presentation Due*
9	**Student Presentations** **Workshop:** N/a Presentations Read: Storytelling with Data Chapter 10	Reflection 7 Presentation Due
10	**Infographics and Course Wrap Up** **Workshop:** Creating Infographics Listen: [99 Percent Invisible: In the Unlikely Event](#)	Quiz 3 Seek and Find: Great Infographic
11	**Exam Week**	Infographic due*

📋 Grading Policies

Participation and Attendance

This course is all about people and your engagement is critical. During class we'll be doing exercises and learning about new methods.

Participation can look like:
- Showing up to class (on time!)
- Actively engaging in class
- Actively engaging in online discussions
- Actively engaging in group projects
- Checking Canvas for assignments, readings, and information

If you cannot attend class (or will be significantly late), please let me know BEFORE class starts.

I am not grading participation and attendance this year because I know it might represent a hardship and I don't want people coming to class when sick. HOWEVER I do notice who comes to class and who doesn't and I'm not just having class meetings for the heck of it or to amuse myself.

Assignment Due Dates

Without a discussion with the professor, late assignments will be docked one half grade (5% off the total points possible) per day late and are only accepted up to one week beyond the original due date. After that, a grade of zero (0) will be given. Finishing an assignment is not an excuse to miss class.

There is more (but not infinite) flexibility if you communicate with the professor.

Grading

Follows standard MSOE grading scale: A, AB, B, BC, C, CD, D, F

For this course, your grade will be determined as follows:
- Weekly-ish reflections: 15%
- Weekly-ish Seek and Finds: 15%
- Projects: 50%
- Quizzes: 20%

Grading Philosophy

This class may be quite different from what you're used to at MSOE. While you will have a list of requirements, the emphasis here is on the process, not necessarily the end product.

Group Work

I know that group work can be challenging, so for any group assignments you'll submit a brief individual reflection and assessment of your and your classmates' work. These may be used to reweight a portion of your grade. This means that if you aren't contributing your grade is likely to go down but if you are the ONLY contributor on a team, I will recognize that effort.

Extra Credit

Extra credit may be offered by the professor periodically during the quarter. It will be offered to the entire class and no later than Friday of Week 9.

Communication Policies

Respect

All class communications should be professional and respectful. Unprofessional communications (verbal or written), will not receive a response. This includes, but is not limited to: racism, sexism, transphobia, homophobia, aggressive language (with or without profanity), slander, inappropriate topics, etc. This applies not only to communications with myself but with your fellow students as well. If you feel that a classmate is not being respectful, please let them know or talk to me.

This especially applies to microaggressions. I look at the impact, not the intent of the comment. Please think carefully about how you communicate in the class.

I will try to call issues out when I see them, but may miss some. My goal is for this class to be a safe, inclusive environment for all. **Please let me know if you do not feel that this is the case.**

Electronic Communication

In general, email or MS Teams are the best ways to contact me. I will try to return email within 24 hours on weekdays. I will check email once between 5pm and 8:30pm every weeknight and once a day on weekends. Expect a slower response during evenings and weekends than during the workday.

I expect you to check Canvas regularly for readings, assignments, grades, and announcements. Their app is supposedly useful.

Phone Communication

I have listed my cell phone number above. Please respect that this is my personal phone number and use it only if you need to reach me immediately. My phone is off from 10pm to 7am, so you will not get through at that time. Texts usually get quicker responses than phone calls.

When In Doubt

If you think maybe you have a question or find yourself guessing at my intended meaning, please reach out and ask the question or for clarification. Chances are you aren't the only one. In addition, communication is critical for online work. If you are sick and have to miss your group meetings, please let your group (and me) know. If you're starting to spiral into anxiety, let me know (in addition to talking to the Wellness Center). If I don't know, I can't help.

BE VOCAL

I am human and make mistakes. Please be vocal. Tell me if things aren't working for you. Let me know when assignments are confusing. I also appreciate suggestions for how to improve things, but it's up to you to share those with me. I want this to be a good class, but I need your help!

Current Circumstances

Personal Wellbeing

I am your professor, but first and foremost, I am a human. If you do not have a home, food, or childcare or are caring for someone who is sick or are sick yourself, please let me know. I may not be able to help directly, but I can try to connect you to others who can. This will also allow me to understand why you may have additional difficulties turning in work, participating in your group, etc.

Internet Access

While I will post all assignments on Canvas and use Canvas for the majority of the coursework, I will also ensure this material is accessible via email. If for some reason you lose internet access during the quarter please let me know so that I can be flexible.

Empathy

While some of you may feel like this is a return to normal, we are all adjusting to this current mode. This is a weird period for all of us and requires empathy and compassion. While I am willing to be flexible on

occasion, I will be more understanding if you have a good track record in the class. If you've turned nothing in all quarter, have not responded to my emails or early alerts, and at the end of the quarter want to turn everything in all at once, that is not ok. However, if you have been communicative and have been a good teammate, I will be more understanding with delays that were not caused by you. Procrastination is never a valid excuse to turn things in late.

Similarly, I may have times in the quarter where things on my end start falling apart and I get your assignments back late or have to reschedule meetings. (I also have a 5 year old in school who may disrupt things on occasion.) Please be understanding of this as I am understanding of your situations.

Communication is key.

Resources

Drop In Hours
Drop in hours (office hours) are designed for you to ask questions (related to class or not) and get help as well as to have another sounding board or faculty connection. By talking to me, you're helping me get to know you which may allow you to get industry connections, find scholarships, or discover jobs you didn't know existed.

While Tuesdays at 3pm are my UX 3025 office hours, I am around most days from 9:30ish to 5ish. If you want to be sure that I'll be able to talk with you, please set up a time to meet me via calendly.com/panciera.

Student Accessibility Services
For students with documented disabilities, chronic medical conditions or mental health concerns; MSOE provides services to make reasonable accommodations available. If you are a student who requires or anticipates the need for accommodations, please contact Student Accessibility Services Office at 414-277-7281, by email at moureau@msoe.edu, or in person at Kern 250 to discuss appropriate accommodations and eligibility requirements.

Mental and Physical Health
If you find yourself struggling with your mental or physical health this quarter, please feel free to approach me. I try to be flexible and accommodating. You can also receive assistance from The Wellness Center for Advising, Counseling, Health, & Accessibility Needs in Kern 250, 414-277-7590, or wellness@msoe.edu

Raider Success Coaches
To help all students be successful in this course, struggling students will be required to meet with a Raider Success Coach throughout the quarter. These meetings will focus on strategies for academic success. Students will be notified if they need to meet with a Raider Success Coach via email by either myself or Dr. Nadya Shalamova.

Academic Assistance

The Raider Center for Academic Success (RCAS) is available virtually and in person. In addition to 1:1 tutoring for some classes, they also offer writing assistance. Please take advantage of this if you are not a strong writer as communication skills are important to succeed in this class.

University Policies

Nondiscrimination Statement

Milwaukee School of Engineering admits students of any race, color, national and ethnic origin to all the rights, privileges, programs and activities generally accorded, or made available, to students at the university. It does not discriminate on the basis of race, color, national and ethnic origin, religion, age, gender, sexual orientation, marital status or disability in administration of its educational policies, admission policies, scholarship and loan programs, and athletic and other institutionally administered programs. MSOE also maintains its long-standing policy as an Equal Opportunity/Affirmative Action Employer of male and female personnel for its faculty and administrative staff.

Academic Integrity

Academic integrity means that any work you hand in as your own is truly your own and that it represents work developed by you. The consequences for handing in the work of someone else as your own will result in a failing grade for the semester for both you and the person who gave you the file or worksheet. Don't share your electronic files with your friends.

As a course requiring teamwork, collaboration will be necessary to complete assignments, but individuals will be responsible for handing in their own work.

See more detail: https://msoe.app.box.com/s/4c8k9jx8zso5ezybxmszr6zmc73zgoox

Sexual Misconduct

Sexual misconduct will not be tolerated at MSOE.
See more detail: https://msoe.app.box.com/s/o7c2rz2jdweq47trbhrzukeyecwxxb3x

COVID-19

MSOE is committed to the health, safety, and well-being of all members of our community. In an effort to maintain such an environment, as well as to prevent further spread of COVID-19, students, faculty, staff and guests of the university must wear a facial covering in indoor, public spaces.
- Failure to wear a facial covering in class or laboratory will result in your faculty member requiring you to leave class and not return until you have secured a facial covering for yourself.
- Failure to comply with your faculty member's instructions will result in immediate action from the Office of the Dean of Students.
- Failure to comply with this policy will be handled according to the Student Code of Conduct and may result in sanctions, up to and including expulsion.
- The university strongly encourages all students to keep an extra and clean facial covering on their person at all times and strongly discourages students from borrowing and lending others their facial coverings.

If you receive a positive COVID-19 test result; or are symptomatic of COVID-19; or are an unvaccinated student who has been a close contact of an individual who is symptomatic or positive, please login to

my.msoe.edu and click on the COVID-19 Report form located on the home page. Please do not physically come to campus if you are ill or suspect you may be ill. MSOE is committed to your education and your faculty will work to support your learning should you need to isolate or quarantine.